LAB 5

SUBJECT :MATHEMATICS FOR EMBEDDED SYSTEMS
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PROGRAM:

a.

```
#include <limits>
#include <iostream>
#include <cmath>
using namespace std;

long double factorial(long double a)
{
    if(a > 1)
        return a * factorial(a - 1);
    else
        return 1;
}
long double derivative(long double k)
{
      long double x = 0, deg = 3.141592654/180, l=0,m=0,o=0,temp,y=0;

      y = x*(3.141592654/180);
      for (int i=0;i<k;i++)
      {
      temp = sin(y);
      y = sin(y+(3.141592654/180));
      cout << temp << "\n";
      y = y - temp;
      cout << y<< "\n";
      y = y/deg;
      cout << y<< "\n";
            cout << i << "\n"<< y << "\n";
            temp = asin(y);
            y = temp;
      }
      return x;
}
long double power(long double k, long double p)

{
      long double x = k;
      if(p==0)
            return 1;
      else
      {
      for(int i=1;i<p;i++)
      {
            x = x*k;
      }
      return x;
      }
}
```

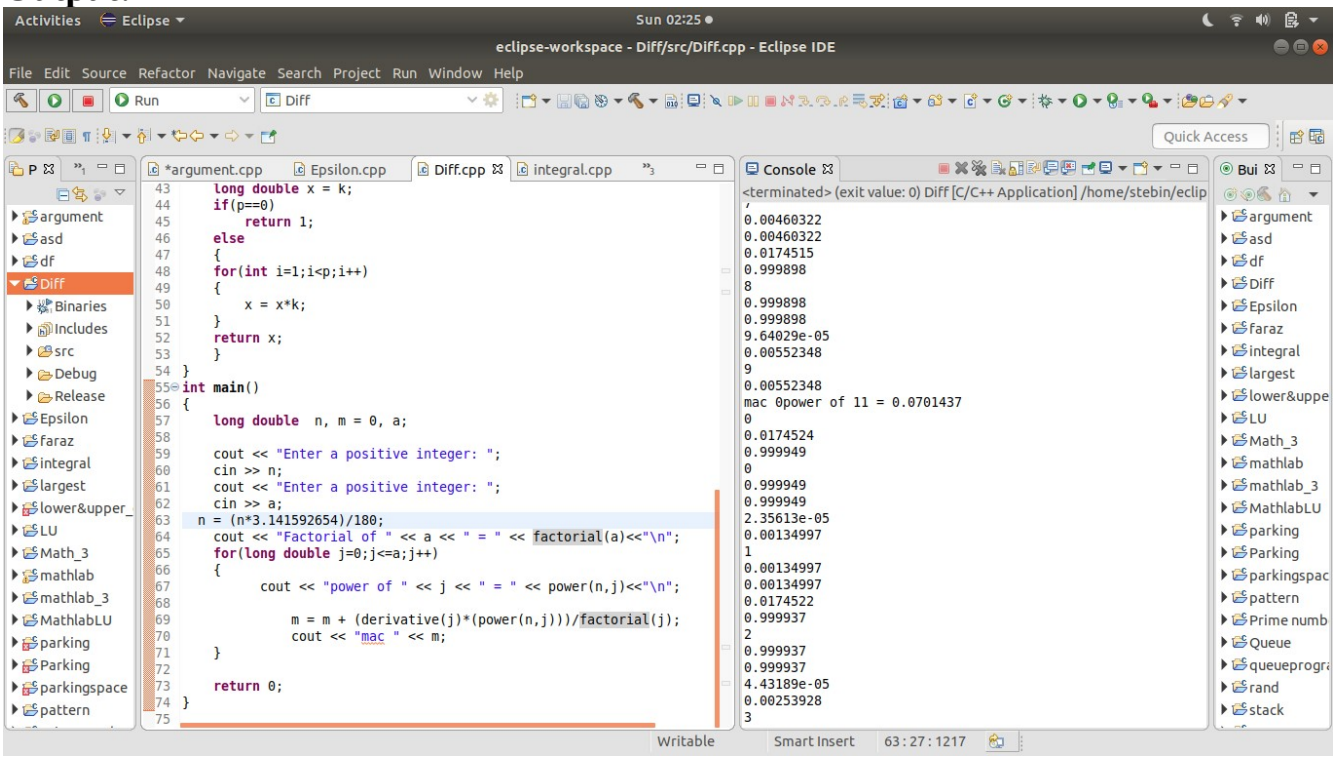
```
int main()
{
    long double  n, m = 0, a;

    cout << "Enter a positive integer: ";
    cin >> n;
    cout << "Enter a positive integer: ";
    cin >> a;
  n = (n*3.141592654)/180;
    cout << "Factorial of " << a << " = " << factorial(a)<<"\n";
    for(long double j=0;j<=a;j++)
    {
        cout << "power of " << j << " = " << power(n,j)<<"\n";

              m = m + (derivative(j)*(power(n,j)))/factorial(j);
              cout << "mac " << m;
    }

    return 0;
}
```

Output:



b. Integral

```
#include <iostream>
#include <cmath>
using namespace std;

int main() {
	float a,b,rad,integral,sum=0;
	a = 0;
	b = 2*3.14159;
	rad = 3.14159/180;
	while(a<b)
	{
	sum = sin(a) + sin(a+rad);
	integral = sum*rad/2;
	a = a+rad;
	}
	cout << "integral =" << integral;


}
```

Output: